

What is claimed:

1 1. A modular elongated stent for holding open a body lumen and
2 for assembly *in situ*, the stent comprising at least a first component and a second
3 component, the stent having an assembled configuration comprising the first component
4 and the second component assembled together, the stent comprising:

5 an overlap region in the first component adapted to receive a portion of
6 the second component in the assembled configuration, the overlap region having a first
7 set of manipulation properties in the assembled configuration;

8 one or more flexible regions attached to the overlap region, each flexible
9 region having a second set of manipulation properties different than the first set of
10 manipulation properties, the second set of manipulation properties including at least one
11 of: greater flexibility, greater kink resistance, or less radial strength than the first set of
12 manipulation properties; and

13 a mimic region attached to the flexible region, the mimic region having
14 a third set of manipulation properties that is essentially equivalent to the first set of
15 manipulation properties.

1 2. The stent of claim 1 wherein the flexible region has first
2 metallurgical properties and the mimic region has second metallurgical properties that
3 are different than the first metallurgical properties.

1 3. The stent of claim 2 wherein the first metallurgical properties are
2 caused by a first annealing history and the second metallurgical properties are caused
3 by a second annealing history.

1 4. The stent of claim 1 wherein the flexible region comprises
2 structural elements having a cross-sectional area and the mimic region comprises
3 structural elements having a cross-sectional area larger than in the flexible region.

1 5. The stent of claim 1 wherein the mimic region comprises
2 reinforcing material attached to the stent.

1 6. The stent of claim 5 wherein the reinforcing material comprises
2 an overlapping stent.

1 7. The stent of claim 5 wherein the reinforcing material comprises
2 one or more stiffening filaments.

1 8. The stent of claim 1 wherein the modular stent comprises a
2 bifurcated modular stent wherein:

3 the first component comprises a bifurcated component comprising a
4 trunk section, a bifurcated section attached to the trunk section and having a first
5 branch comprising a socket and a second branch comprising a fixed leg interface, and a
6 fixed leg section depending from the fixed leg interface, and

7 the second component comprises a modular leg component having a
8 mating portion adapted for mating with the socket,

9 wherein the overlap region comprises the socket, the assembled
10 configuration comprises the mating portion of the modular leg component inserted in
11 the socket, the mimic region comprises the fixed leg interface, and the flexible regions
12 comprise the trunk section and the fixed leg section.

1 9. The stent of claim 8 further comprising a transition region
2 between the fixed leg and the fixed leg interface and a transition mimic region in the

3 modular leg component adjacent the mating portion, the transition region comprising an
4 intermediate set of manipulation properties between the second set of manipulation
5 properties and the third set of manipulation properties and the transition mimic region
6 comprising a fourth set of manipulation properties essentially equivalent to the
7 intermediate set of manipulation properties.

1 10. The stent of claim 1 further comprising a transition region
2 between the flexible region and the mimic region, the transition region comprising an
3 intermediate set of manipulation properties between the second set of manipulation
4 properties and the third set of manipulation properties.

1 11. The stent of claim 9 wherein the transition region comprises a
2 gradient of manipulation properties from the second set of manipulation properties to
3 the third set of manipulation properties.

1 12. The stent of claim 1 wherein the overlap region has a first
2 stiffness, the flexible region has a second stiffness less than the first stiffness, and the
3 mimic region has a third stiffness essentially equivalent to the first stiffness, the stent
4 further comprising a transition region between the flexible region and the mimic region,
5 the transition region comprising an intermediate stiffness greater than the second
6 stiffness and less than the third stiffness.

1 13. The stent of claim 12 wherein the transition region comprises a
2 stiffness gradient from the second stiffness to the third stiffness.

1 14. The stent of claim 11 wherein the transition region comprises a
2 bridging material attached to the stent between the mimic region and the flexible
3 region.

1 15. The stent of claim 14 wherein the bridging material comprises
2 one or more wires attached to the stent.

1 16. The stent of claim 11 wherein the mimic region has different
2 metallurgical properties than the flexible region and the transition region comprises a
3 gradient of metallurgical properties from the flexible region to the mimic region.

1 17. The stent of claim 1 wherein the mimic region comprises a
2 region of different stent architecture relative to the flexible region.

1 18. The stent of claim 17 wherein the stent architecture of the flexible
2 region comprises a geometry having a recurrent pattern of geometric elements in an
3 arrangement of circumferential hoops axially attached to one another, one or more
4 elements of each hoop comprising connected elements that are connected to an axially
5 adjacent hoop, any elements not connected to an axially adjacent hoop being
6 unconnected elements, each element having an element height and an included angle,
7 each hoop comprising a number of elements and a ratio of connected elements to
8 unconnected elements, the mimic region and the flexible region differing in stent
9 architecture by one of: the element height, the number of elements in each hoop, the
10 included angle, the ratio of connected to unconnected elements, or a combination
11 thereof.

1 19. The stent of claim 18 further comprising a transition region
2 between the flexible region and the mimic region, the transition region comprising a
3 gradient from the second set of manipulation properties to the third set of manipulation
4 properties, wherein said transition region comprises one of: an intermediate element
5 height, an intermediate number of elements in each hoop, an intermediate included
6 angle, an intermediate ratio of connected to unconnected elements, or a combination
7 thereof.

1 20. The stent of claim 17 wherein the stent architecture of the flexible
2 region comprises a geometry having a recurrent pattern of diamond-shaped elements in
3 an arrangement of circumferential hoops axially attached to one another, each diamond-
4 shaped element having an interface with at least one other diamond-shaped element, at

5 least one interface comprising a box node, interfaces without a box node comprising an
6 empty interface, each definable region of the stent having a ratio of box nodes to empty
7 interfaces, the mimic region and the flexible region differing in stent architecture by the
8 ratio of box nodes to empty interfaces in each region.

1 21. The stent of claim 20 further comprising a transition region
2 between the flexible region and the mimic region, the transition region comprising a
3 gradient from the second set of manipulation properties to the third set of manipulation
4 properties, wherein said transition region comprises one of: an intermediate ratio of box
5 nodes to empty interfaces, a gradient of ratios of box nodes to empty interfaces, or a
6 combination thereof.

1 22. A method for providing an elongated stent to hold open a
2 designated portion of a body lumen having one or more curved regions, the designated
3 portion having a length and the stent having an expanded configuration for deployment
4 within the body lumen, a compressed configuration for introduction and transport
5 within the lumen prior to deployment, and a length in the expanded configuration
6 equivalent to the length of the designated portion, the method comprising:

7 a) designing and fabricating the stent comprising one or more
8 relatively stiff regions having a first stiffness and one or more relatively flexible regions
9 having a second stiffness less than the first stiffness, each of the relatively flexible
10 regions positioned to align with one of the curved regions of the body lumen when the
11 stent is deployed within the body lumen;

12 b) compressing the stent, loading it within an introducer, and
13 introducing the stent into the body lumen, and

14 c) deploying the stent from the introducer into the body lumen and
15 positioning each of the relatively flexible regions in alignment with one of the curved
16 regions of the body lumen.

1 23. The method of claim 22 wherein fabricating the stent in step (a)
2 comprises providing the relatively stiff region with first metallurgical properties and
3 providing the relatively flexible region with second metallurgical properties different
4 than the first metallurgical properties.

1 24. The method of claim 22 wherein fabricating the stent in step (a)
2 comprises providing the relatively stiff region with a plurality of structural elements
3 having a first cross-sectional area and providing the relatively flexible region with a
4 plurality of structural elements having a second cross-sectional area smaller than the
5 first cross-sectional area.

1 25. The method of claim 22 wherein fabricating the stent in step (a)
2 further comprises providing one or more transition regions, each transition region
3 positioned at an interface between each relatively stiff region and an adjacent relatively
4 flexible region, each transition region comprising an intermediate stiffness less than the
5 first stiffness and greater than the second stiffness.

1 26. The method of claim 25 wherein step (a) further comprises
2 providing the transition region with a stiffness gradient from the first stiffness to the
3 second stiffness.

1 27. The method of claim 26 wherein step (a) further comprises
2 attaching bridging material to the stent between the relatively stiff region and the
3 relatively flexible region to provide the transition region.

1 28. The method of claim 27 wherein step (a) further comprises
2 welding one or more wires between the relatively stiff region and the relatively flexible
3 region as bridging material.

1 29. The method of claim 26 wherein step (a) further comprises
2 providing the flexible region with different metallurgical properties than the relatively

3 stiff region and step (a) further comprises providing the transition region with a
4 gradient of metallurgical properties from the relatively flexible region to the relatively
5 stiff region.

1 30. The method of claim 25 wherein step (a) comprises providing the
2 relatively stiff region with a plurality of structural elements having a first cross-
3 sectional area, providing the relatively flexible region with a plurality of structural
4 elements having a second cross-sectional area smaller than the first cross-sectional area,
5 and providing the transition region with structural elements having a third cross-
6 sectional area intermediate the first cross-sectional area and the second cross-sectional
7 area.

1 31. The method of claim 26 wherein step (a) further comprises
2 forming a plurality of structural elements in the relatively stiff region, a plurality of
3 structural elements in the relatively flexible region, and a plurality of structural
4 elements in the transition region with a continuous wire having a diameter gradient
5 from a relatively large diameter in the stiff region to a relatively small diameter in the
6 flexible region.

1 32. An elongated stent for holding open a body lumen, the stent
2 comprising:

3 at least one stiff region having a first set of manipulation properties;

4 at least one flexible region having a second set of manipulation
5 properties different than the first set of manipulation properties, the second set of
6 manipulation properties including at least one of: greater flexibility, greater kink
7 resistance, or less radial strength than the first set of manipulation properties; and

8 at least one transition region between the stiff region and the flexible
9 region having an intermediate set of manipulation properties between the first set of

10 manipulation properties and the second set of manipulation properties, the transition
11 region comprising a bridging material attached to the stent.

1 33. The stent of claim 32 wherein the transition region comprises a
2 gradient between the first set of manipulation properties and the second set of
3 manipulation properties.

1 34. The stent of claim 33 wherein the bridging material comprises
2 one or more filaments attached to the stent.

1 35. The stent of claim 34 wherein the attached filaments comprise
2 wires welded to the stent.

1 36. An elongated stent for holding open a body lumen, the stent
2 comprising at least a first longitudinal region having first metallurgical properties and a
3 second longitudinal region having second metallurgical properties.

1 37. The stent of claim 36 wherein the first metallurgical properties
2 are caused by a first annealing history and the second metallurgical properties are
3 caused by a second annealing history.

1 38. The stent of claim 36 further comprising a transition region
2 between the first longitudinal region and the second longitudinal region, the transition
3 region having third metallurgical properties.

1 39. The stent of claim 36 further comprising a transition region
2 between the first longitudinal region and the second longitudinal region, the transition
3 region having a gradient of metallurgical properties between the first metallurgical
4 properties and the second metallurgical properties.

1 40. A method for providing kink resistance in an elongated stent
2 adapted to hold open a body lumen, the stent having at least one stiff region with a first
3 set of manipulation properties and at least one flexible region with a second set of
4 manipulation properties different than the first set of manipulation properties, the
5 second set of manipulation properties including at least one of: greater flexibility,
6 greater kink resistance, or less radial strength than the first set of manipulation
7 properties, the method comprising:

8 providing a mimic region having a third set of manipulation properties
9 essentially equivalent to the first set of manipulation properties.

1 41. The method of claim 40 wherein providing the mimic region
2 comprises modifying the mimic region relative to the flexible region by one of:
3 modifying the metallurgical properties, providing members having a larger cross-
4 sectional area, attaching reinforcing material, modifying the stent architecture, applying
5 a polymer coating, or a combination thereof.

1 42. The method of claim 41 wherein modifying the metallurgical
2 properties comprises heat treating the mimic region.

1 43. The method of claim 42 wherein the heat treating step comprises
2 local laser heat treating.

1 44. The method of claim 41 wherein modifying the metallurgical
2 properties comprises providing a different annealing history for the mimic region.

1 45. The method of claim 44 wherein providing the different annealing
2 history for the mimic region comprises:

3 a) providing a zoned annealing furnace having a relatively hotter
4 region with a first temperature and a relatively cooler region with a second temperature
5 less than the first region; and

6 b) annealing the stent by exposing the flexible region of the stent to
7 the relatively hotter region and exposing the stiff region of the stent to the relatively
8 cooler region.

1 46. The method of claim 44 wherein providing the different annealing
2 history for the mimic region comprises:

3 a) mounting the stent on a mandrel during annealing, the mandrel
4 having a relatively high heat sink region and a relatively low heat sink region, the
5 relatively high heat sink region of the mandrel co-located with the stiff region of the
6 stent; and the relatively low heat sink region of the mandrel co-located with the flexible
7 region of the stent; and

8 b) providing with the relatively high heat sink region a longer heat-
9 up time for the stiff region than the relatively low heat sink region provides for the
10 flexible region during annealing, so that the flexible region experiences a greater
11 thermal input than the stiff region.

1 47. The method of claim 46 further comprising fabricating the
2 mandrel such that the relatively high heat sink region has greater cross-sectional mass
3 than the relatively low heat sink region.

1 48. The method of claim 44 wherein providing the different annealing
2 history for the mimic region comprises:

3 a) mounting the stent on a mandrel during annealing, the mandrel
4 having a relatively high thermal conductivity region and a relatively low thermal

5 conductivity region, the relatively high thermal conductivity region of the mandrel co-
6 located with the stiff region of the stent; and the relatively low thermal conductivity
7 region of the mandrel co-located with the flexible region of the stent; and

8 b) providing with the relatively high thermal conductivity region a
9 longer heat-up time for the stiff region than the relatively low thermal conductivity
10 region provides for the flexible region during annealing, so that the flexible region
11 experiences a greater thermal input than the stiff region.

1 49. The method of claim 48 further comprising fabricating the
2 mandrel such that the relatively high thermal conductivity region comprises a metal and
3 the relatively low thermal conductivity region comprises a ceramic.

1 50. The method of claim 44 wherein providing the different annealing
2 history for the mimic region comprises:

3 a) mounting the stent on a mandrel having a relatively high thermal
4 conductivity;

5 b) covering the stiff region with a collar of a relatively low thermal
6 conductivity material; and

7 c) annealing the stent using a heat source such that the collar shields
8 the stiff region from the heat source so that the flexible region experiences a greater
9 thermal input than the stiff region.

1 51. The method of claim 50 further comprising fabricating the
2 mandrel such that the mandrel comprises a metal and the collar comprises a ceramic.

1 52. The method of claim 41 wherein attaching reinforcing material
2 comprises attaching one or more stiffening filaments.

1 53. The method of claim 41 wherein attaching reinforcing material
2 comprises attaching an overlapping stent.

1 54. A method for minimizing kinking of an elongated stent during
2 introduction of the stent through the body lumen to a deployment location and during
3 deployment of the stent at the deployment location, the stent having at least one stiff
4 region with a first set of manipulation properties adjacent to at least one flexible region
5 with a second set of manipulation properties different than the first set of manipulation
6 properties, the second set of manipulation properties including at least one of: greater
7 flexibility, greater kink resistance, or less radial strength than the first set of
8 manipulation properties, the method comprising:

9 a) fabricating the stent with a transition region between the stiff
10 region and each flexible region, the transition region having a third set of manipulation
11 properties between the first set of manipulation properties and the second set of
12 manipulation properties;

13 b) radially compressing the stent and loading the stent into an
14 introducer; and

15 c) navigating the introducer through a tortuous body lumen while
16 the transition region minimizes kinking of the stent resulting from the difference
17 between the first set of manipulation properties and the second set of manipulation
18 properties.

1 55. The method of claim 54 wherein step (a) further comprises
2 providing the transition region with a gradient from the first set of manipulation
3 properties to the second set of manipulation properties.

1 56. The method of claim 55 wherein step (a) further comprises
2 providing the transition region with the gradient by attaching bridging filaments
3 between the stiff region and the flexible region.

1 57. The method of claim 55 wherein step (a) further comprises
2 providing the flexible region with first metallurgical properties and providing the stiff
3 region with second metallurgical properties, wherein the step of providing the transition
4 region with a gradient comprises providing the transition region with a gradient of
5 metallurgical properties from the stiff region to the flexible region.

1 58. The method of claim 55 wherein step (a) further comprises
2 providing the stent with a stent architecture comprising a recurrent pattern of geometric
3 elements in an arrangement of circumferential hoops axially attached to one another,
4 one or more elements of each hoop comprising connected elements that are connected
5 to an axially adjacent hoop, any elements not connected to an axially adjacent hoop
6 being unconnected elements, each hoop comprising a number of elements and a ratio of
7 connected to unconnected elements, the stiff region and the flexible region differing in
8 stent architecture by one of: the number of elements in each hoop, the ratio of
9 connected to unconnected elements, or a combination thereof, wherein providing the
10 transition region with a gradient in manipulation properties comprises providing a
11 gradient between the stiff region and the flexible region in one of: the number of
12 elements in each hoop, the ratio of connected to unconnected elements, or a
13 combination thereof.

1 59. The method of claim 54 wherein step (a) further comprises
2 providing the stent with a stent architecture comprising a geometry having a recurrent
3 pattern of diamond-shaped elements in an arrangement of circumferential hoops axially
4 attached to one another, each diamond-shaped element having an interface with at least
5 one other diamond-shaped element, at least one interface comprising a box node,
6 interfaces without a box node comprising an empty interface, each definable region of

7 the stent having a ratio of box nodes to empty interfaces, the mimic region and the
8 flexible region differing in stent architecture by the ratio of box nodes to empty
9 interfaces in each region, wherein providing the transition region comprises providing
10 an intermediate stent architecture between the flexible region and the mimic region
11 comprising an intermediate ratio of box nodes to empty interfaces.

1 60. The method of claim 59 wherein step (a) further comprises
2 providing the transition region with a gradient from the first set of manipulation
3 properties to the second set of manipulation properties by providing a gradient in the
4 ratio of box nodes to empty interfaces across the transition region.

1 61. A method for providing an elongated stent for holding open a
2 body lumen with a first longitudinal region having a first set of metallurgical properties
3 and a second longitudinal region having second set of metallurgical properties, the
4 method comprising exposing the first longitudinal region to a first annealing history and
5 exposing the second longitudinal region to a second annealing history.

1 62. The method of claim 61 further comprising providing a third,
2 transitional longitudinal region intermediate the first longitudinal region and the second
3 longitudinal region, the third longitudinal region having a third, transitional set of
4 metallurgical properties intermediate the first set of metallurgical properties and the
5 second set of metallurgical properties, the method comprising exposing the third
6 longitudinal region to a third annealing history.

1 63. The method of claim 61 wherein exposing the first longitudinal
2 region to a first annealing history and exposing the second longitudinal region to a
3 second annealing history comprises:

4 a) providing a zoned annealing furnace having a first zone with a
5 first temperature and a second zone with a second temperature; and

6 b) annealing the stent by exposing the first longitudinal region of the
7 stent to the first zone of the furnace while exposing the second longitudinal region of
8 the stent to the second zone of the furnace.

1 64. The method of claim 63 further comprising creating a third
2 longitudinal region of the stent intermediate the first longitudinal region and the second
3 longitudinal region, the third longitudinal region having a third set of manipulation
4 properties, the method comprising providing a transition region between the first zone
5 and the second zone, the transition region comprising a range of temperatures between
6 the first temperature and the second temperature, and annealing the stent by exposing
7 the third longitudinal region to a third annealing history by exposing the third
8 longitudinal region to the third zone of the furnace.

1 65. The method of claim 61 wherein exposing the first longitudinal
2 region to a first annealing history and exposing the second longitudinal region to a
3 second annealing history comprises:

4 a) providing a mandrel having a first region adapted to provide a
5 first heat-up time and a second region adapted to provide a second heat-up time when
6 the mandrel is initially placed in an annealing furnace;

7 b) mounting the stent on the mandrel such that the first longitudinal
8 region of the stent is aligned with the first region of the mandrel and the second
9 longitudinal region of the stent is aligned with the second region of the mandrel; and

10 c) annealing the stent such that the first longitudinal region
11 experiences a different thermal input than the second longitudinal region.

1 66. The method of claim 65 further comprising creating a third
2 longitudinal region of the stent intermediate the first longitudinal region and the second
3 longitudinal region, the third longitudinal region having a third set of manipulation

4 properties, the method comprising providing a transition region on the mandrel between
5 the first region and the second region, the transition region adapted to provide a third
6 heat-up time intermediate the first heat-up time and the second heat-up time, and
7 annealing the stent so that the third longitudinal region experiences an intermediate
8 thermal input between the thermal input experienced by the first longitudinal region and
9 the thermal input experienced by the second longitudinal region.

1 67. The method of claim 66 comprising providing the third region if
2 the mandrel with a gradient heat-up time between the first heat-up time and the second
3 heat-up time, and creating the third longitudinal region with a stiffness gradient in
4 manipulation properties between the first set of manipulation properties and the second
5 set of manipulation properties.

1 68. The method of claim 65 wherein providing the mandrel having a
2 first region and a second region comprises providing the first region having a different
3 property than the second region, the different property comprising one of: thermal
4 conductivity, thermal mass per unit length, or a combination thereof.

1 69. The method of claim 66 wherein providing the transition region
2 on the mandrel between the first region and the second region comprises providing the
3 transition region with a property intermediate variations in that property between the
4 first and second regions of the mandrel, the property comprising one of: thermal
5 conductivity, thermal mass per unit length, or a combination thereof.

1 70. The method of claim 67 comprising providing the transition
2 region of the mandrel with gradient heat-up time between the first heat-up time and the
3 second heat-up time comprises providing the transition region with a property having a
4 gradient in that property between the first and second regions of the mandrel, the
5 property comprising one of: thermal conductivity, thermal mass per unit length, or a
6 combination thereof.

1 71. The method of claim 61 wherein exposing the first longitudinal
2 region to a first annealing history and exposing the second longitudinal region to a
3 second annealing history comprises:

4 a) mounting the stent on a mandrel having a relatively high thermal
5 conductivity;

6 b) covering the first longitudinal region of the stent with a shielding
7 collar of a relatively low thermal conductivity material; and

8 c) annealing the stent using a heat source such that the collar shields
9 the first longitudinal region from the heat source so that the second longitudinal region
10 experiences a higher thermal input than the first longitudinal region.

1 72. The method of claim 71 wherein the shielding collar over the first
2 longitudinal region has a first thickness, the method further comprising creating a third
3 longitudinal region of the stent intermediate the first longitudinal region and the second
4 longitudinal region, the third longitudinal region having a third set of manipulation
5 properties, the method comprising covering the third longitudinal region of the stent
6 with a transition collar comprising one of: (i) a second thickness less than the first
7 thickness, (ii) an intermediate thermal conductivity material having a thermal
8 conductivity intermediate the mandrel material and the material over the first
9 longitudinal section, (iii) or a combination thereof, wherein the transition collar is one
10 of: a separate collar from the shielding collar or a section of the shielding collar; and
11 annealing the stent such that the transition collar shields the third longitudinal region
12 from the heat source to a lesser degree than the first longitudinal region is shielded,
13 allowing the third longitudinal region to experience an intermediate thermal input
14 between the thermal input experienced by the first longitudinal region and the thermal
15 input experienced by the second longitudinal region.

1 73. The method of claim 72 comprising providing the transition
2 collar with a thickness gradient, and creating the third longitudinal region with a
3 stiffness gradient in manipulation properties between the first set of manipulation
4 properties and the second set of manipulation properties.

1 74. The stent of claim 1 wherein the stent comprises one or more
2 filaments formed in a pattern comprising one or more contact points or near-contact
3 points and one or more interstitial spaces bounded by the filaments, and the mimic
4 region comprises a polymer coating on the filaments in the mimic region that does not
5 substantially occlude the interstitial spaces.

1 75. The stent of claim 74 wherein the overlap region has a first
2 stiffness, the flexible region has a second stiffness less than the first stiffness, and the
3 mimic region has a third stiffness essentially equivalent to the first stiffness, the stent
4 further comprising a transition region between the flexible region and the mimic region,
5 the transition region comprising an intermediate stiffness greater than the second
6 stiffness and less than the third stiffness, the polymer coating on the filaments in the
7 mimic region having a first thickness and the filaments in the transition region having a
8 polymer coating of a second, lesser thickness.

1 76. The stent of claim 75 wherein the polymer coating in the
2 transition region comprises a thickness gradient that provides a stiffness gradient from
3 the second stiffness to the third stiffness.

1 77. The method of claim 22 wherein step (a) comprises fabricating
2 the stent from one or more filaments formed in a pattern comprising one or more
3 contact points or near-contact points and one or more interstitial spaces bounded by the
4 filaments, and coating the filaments in the relatively stiff region with a polymer that
5 does not substantially occlude the interstitial spaces.

1 78. The method of claim 77 wherein fabricating the stent in step (a)
2 further comprises providing one or more transition regions, each transition region
3 positioned at an interface between each relatively stiff region and an adjacent relatively
4 flexible region, each transition region comprising an intermediate stiffness less than the
5 first stiffness and greater than the second stiffness, the polymer coating on the filaments
6 in the relatively stiff region having a first thickness and the filaments in the transition
7 region having a polymer coating of a second, lesser thickness.

1 79. The method of claim 78 wherein fabricating the stent in step (a)
2 further comprises providing the polymer coating in the transition region with a
3 thickness gradient that provides a stiffness gradient from the second stiffness to the
4 third stiffness.

1 80. The method of claim 54 wherein step (a) comprises fabricating
2 the stent from one or more filaments formed in a pattern comprising one or more
3 contact points or near-contact points and one or more interstitial spaces bounded by the
4 filaments, and coating the filaments in the stiff region with a first thickness of a
5 polymer without substantially occluding the interstitial spaces, and coating the filaments
6 in the transition region with a second, lesser thickness of the polymer.

1 81. The method of claim 80 wherein step (a) further comprises
2 providing the polymer coating in the transition region with a thickness gradient that
3 provides a gradient in manipulation properties from the second set of manipulation
4 properties to the third set of manipulation properties.